Data for paper
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Geo. W. Tlett co-author

Parasitic Jaeger – Stercorarius parasiticus

Specimen No.	Left RT Humerus	Ulna	Radius Carpo-metacarpus	Femur	Tibia	Tarsus	Coracoid	B. S. Sternum	Head & beak Length Bill Sad.	Head & beak Breadth Bill	Wing Length	Sex	Age	Time	Color Tarsi	Pelvis Br.	Pelvis Dep.
Bi 809 skin L.C.M. 18159	Rat. to tarso 46.5% 94.5 97.3	43.1% — 101.8	44.6% 98.5	37.4 —		43.8	33.1 32.0	45.5% 32.3 71.0	30.0 14.8 12.2 16.0 16.0	12.0	319 3	♀	2	Aug. 12 1933	Blue	23.9	52.4
Bi 574 skin L.A.M. 17488	Rat. to tarso 44.7% 96.2 96.4	— —	42.8% 100.5	37.2 37.5		43.1	33.6 33.9	44.5% 32.4 72.8	30.2 14.6 12.7 15.0 16.0	12.0	326 6	♀	ad	Sept. 17, 1931	Black	24.3	51.7
Bi 578 skin-K. Stager 303	Ratio tarso 48.0% 97.8 97.8	— —	46.0% 102.1	39.7 39.9		47.	33.8 33.6	44.7 32.3 72.1	29.9 13.6 sad. worn 16.0 15.8	10.0	315 2	♀	juv.	Sept. 17, 1931	Blue	25.5	53.3
Bi 391. No skin	Rat. to tarso 42.1% 99.3 99.4	106.7	103.2 52.3 —		— 65.6	41.7 —		46.1 33.5 72.6				♀	ad	Sept. 24, 1929	—	26.0	54.6
Bi 385 skin-G. Willett 2846	Rat. to tarso 46.1% — 99.6	42.3% 108.5 —	43.6% 103.2	39.5 39.4		45.8	35.6 35.5	42.7 34.7 74.3	34.6 16.0 13.1 18.9 17.0	13.2	327 7	♀	ad	Sept. 5, 1929	Black	25.1	55.2
Bi 632 skin K. Stager 302	Rat. to tarso 45.7% 100.3 100.3	42.5% — 108.2	— 39.5 39.5			46.0	34.7 34.6	46.0 32.5 70.6	29.5 14.7 13.5 13.2 13.6	10.0	322 4	♀	2	Sept. 17, 1931	Part Blue	23.6	53.4
Bi 386 skin J. Willett 2847	Rat. to tarso 45.1% 102.7 —	43.6% — 107.6	45.2% 104.0	40.9 40.9		46.4	— 35.2	45.5 34.3 75.4	33.5 15.3 14.1 17.9 17.5	11.3	324 5	♂	2	Sept. 15, 1929	Black	26.5	55.2
Bi 808 skin L.C.M. 18158	Rat. to tarso 43.7% 103.2 103.1	— —	— —	39.9 39.7		45.3	35.5 35.3	46.3 33.7 72.7	32.2 16.0 13.3 16.8 16.8	12.0	340 11	♀	ad.	Aug. 12, 1933	Black	26.9	54.0
Bi 819 skin G. Willett 3744	Rat. to tarso 46.1% 103.9 103.6	43.3% 110.8 —	44.5% 107.5	— 40.0		47.8	36.5 36.1	49.6 37.8 76.3	29.0 14.7 12.3 14.6 15.5	11.0	312 1	♀	juv.	Sept. 10 1933	Blue		
Bi 528 skin L.C.M. 18182	Rat. to tarso 44.7% 100.2 100.0	42.2% — 106.4	43.8% 103.7 62.8 —	39.4 39.4		44.8	34.8 35.2	47 — 33.9 72.9	27.2 11.6 11.7 13.2 14.2	10.0	330 8	♀	juv.	Sept. 20, 1933	Blue		
Bi 565 No skin	Rat. to tarso 45.6% 103.6 103.8	41.0% 110.7 110.1	42.2% 107.4 53.8 53.9	40.4 40.4	67.4 68.0	45.3	36.3 36.1	47.2 35.1 75.4				♂		Oct. 1 1931	—	25.2	54.2
Human juried skin L.A.M. 18184	Rat. to tarso 45.4% 104.6 104.5	— —				47.5			32.0 14.0 12.3 16.4 17.0	12.0	335 10	♂	ad	Oct. 15, 1933	Black		
Bi 315 skin G. Willett 2823						46.0	— 36.1	45.8 34.7 75.6	34.8 15.8 13.0 19.6 16.2	11.6	332 9	♀	2.	Oct. 28, 1928	Black	26.5	55.3
Av.	100.4 100.5 100.2	107.2 112.3 106.8	103.6	39.4 39.3 39.5	67.0	45.8	34.3 34.3 34.3	33.7 76.7	31.1 16.1 16.0	11.3	325					25.3	53.9
Max	104.6 104.5	110.8 110.1	107.4	40.9 40.9	67.4 68.0	47.8	36.5 36.1	49.6 37.8 76.3	34.8	12.0	335					26.9	55.3
Min	94.5 94.3	106.7 101.8	98.5	37.2 37.5	— 65.6	43.1	33.1 32.7	31.7 70.6	27.2	10.0	312					23.6	52.4

(1) Length of supra-nasal saddle decidedly greater than distance from its anterior end to tip of maxillary unguis - parasitica

(2) Length middle pair retrices - ad in summer plumage

(3) Color of feet - not in jaws.

. Saddle badly worn even in juv. ♀ 687

longi. — length of supra-nasal saddle ~~not~~ greater than distance from its ant. end to tip of max. unguis

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Stejneger p 88.

Dist. fm ant. Border of nostril to tip of bill relative to length of nasal shield along the culmen in longicaudus the 2 distances are of equal length. — in parasitica the nasal shield is much longer

Specimen No.	L humerus	R ulna	Radius	femur	Tibia	Tarsus	coracoid	B L Sternum	Length Bill	Breadth Bill	Length wing	Sex age	Mine	Color Tarsi
Miller 10471 Shasta 1612	44.4% 98.3 98.5	42.6% 104.9		48.0	67.3	44.7		33.0 33.9				♂ ad	Pt Reyes Sept 24, 1923	Black
Miller 821 Shasta 1566	45.0% 98.4 98.5					44.3						♀ ad	5/15/26 Pt Reyes	Black
Miller 935 No Shasta	45.9% 101.5	42.2% 110.2	43.4% 107.3	49.5		46.6		33.5				♂	Oct, 1928 Sausalito	
Bishop 43813 Barnowl. S. parantius		108.2	105.3	Ratio ulna tars 43.7	Ratio rad. tars 44.6	47.0	Ratio humer. tars.					♀ ad		Dark phase Black
Bishop 43815 Barowl S. para.		105.4	101.6	42.9	44.6	45.3						♂ ad		Dark phase Black
Bishop 39927 Bishop's owl Strigidae S. cepedianus		103.4 103.8		41.3	X	42.9						♂ juv.		Dark phase Blue
Bishop 42889 S. cepedianus Bubo virginianus		101.9	98.3	42.6%	44.2%	middle tar. 43.4						♂ juv		Dark phase Blue
Bishop 42885 Bubo virginianus Strigidae	95.2	99.2 100.2	96.2 96.7	42.3%	43.7%	42.4	44.5%					♂ juv.		Dark phase Blue Bare spot Back
Bishop 39925 parantius Iceland July 1, 1885		X										♀ ad		Dark phase Black
Tavernier 19798 parant		109.2	106.0	43.6%	45.0%	44.7						♀ juv		blue
Tavernier 23533 parant.		103.7	100.6	40.2%	41.4	41.7						juv		blue
Tavernier 11571 longi	86.1	91.4	89.8	46.2%	47.1	42.3	49.1					juv		blue

S. parasitacus

All agree to S. para

Mildred Sykes Hill
(Mrs. Howard J. Hill)
329 Summit Ave.
Redlands
Calif.

Long-tailed Jaeger — Stercorarius longicaudus

Specimen No.	Rt. Humerus	Rt. Ulna	Radius	Femur	Tibia	Tarsus	Coracoid	Br. Sup. Sternum	Length bill, sad. gapus	Breadth bill	Length wing	Sex age	Time	Color Taxi	Pelvis / Tail
WHB 3060 Pt. Barrow Alaska MVZ 142257	84.9 84.8	91.5 —	89.1			46.0			26.7	8.7	300	♂ subad	July 29, 1929 Alaska July 29, 1933	Blue	24.0
Bi 797 Smiths. Gr. Widd. ✓ 3733	Rat. Ulna 54.2% 83.0 —	49.4% 90.9	51.7% 88.9	34.9 —	61.8 62.2	44.9	29.4	55.7% 32.8 58.8	26.5 11.2 12.2 13.6 13.7	9.4	298	♂ juv.		Blue	21.4 48.9
Bi 413a Smiths L.A.M. ✓ 16882	Rat. Ulna 50.7% 83.9 83.7	49.1% 91.0	50.6% 88.3			44.0			26.0 11.1 13.0 11.0 16.2	9.0	300	? ad.	Alaska July 1928	Blue	
Bi 820 Smiths L.A.M. ✓ 18179	Rat. Ulna 53.3% 86.7 86.6	— computed from 2 radius	51.5% 89.8	34.9 —		46.3	30.7 30.5	43.2% 26.5 61.4	27.0 10.5 11.7 17.4 13.2	9.0	292	♂ juv.	Sept. 13, 1933	Blue	22.3 48.6
Bi 413b Smiths L.A.M. ✓ 16881	Rat. Ulna 52.5% 87.6 89.5	48.3% 96.7	52.7% 93.7			44.4			26.0 11.4 12.3 12.0 14.8	9.0	310	? ad.	July 1928 Alaska	Blue	
Average	85.5 85.3 85.9	91.3	89.1	35.4	62.0	44.6	30.2	29.6 60.1	27.0 13.0 14.7	9.2	307				21.8 48.7
Max.	87.6 87.5	91.7	89.3			46.3		32.8 61.4	29.2	10.0	332				22.3 48.5
Min.	83.0 —	90.9	88.9			43.5		26.5 58.8	26.0	9.0	292				21.4 45.9
3269 Willett		47.4% 91.7	89.0			43.5			27.9 11.5 12.8 12.7 15.0	9.3	332	♂ ad	Alaska May 26, 1921	Blue	
14017 L.A. ???						45.7			26.6 13.0 13.0 12.5 13.0	10.0	313	♀ ad	Alaska Aug. 11	Blue	
2820 Willett		105.9				45.5			27.0 12.4 12.3 12.0 16.0	9.0	311	juv.	Oct 21 1928	Blue	parasites
2806 Willett		103.0	computed from 100.0			43.5			29.2 13.0 11.9 16.2 13.8	9.3	300	♀ ad.	Sept. 23 1928	Blue	parasites

6.7 mm. dif.

Humerus Largest longi. = 87.6; shortest para. = 94.3; aver. l. 85.5; p. 100.4

Ulna, longi. resp. longest = 91.7; shortest p. = 101.8 = 10.1 mm. dif.

radius " 2nd longest = 89.3 " " = 100.5 = 11. mm dif.

Carpus — out

Femur of 2 sps. largest l. = 38.9; shortest par. = 37.2

Tibia " " " " = 62.2; shortest par = 65.6

Tarsus Longest longi = 46.3; shortest par = 43.1

Coracoid " " = 30.7; " " = 32.7

sternum " " = 61.4; " " = 72.0

" broadest " = 32.8; narrowest " = 31.7 Breadth varies too much to consider

Bill longest " = 29.2; shortest " = 27.2

" broadest " = 10.0; narrowest " = 10.0

Wing longest " = 332; shortest " = 312

There Judging from the 12 avail. para. there is no sex dif. in length of humerus.

Ridgway indicates no sex dif. in size of birds and

Nor is there any dif. in the size of skeletal elements vary with the age of the birds. This is to be expected for once the bird bone is completely ossified there is no way for it to increase in length and

Nor is there any dif. in length variation of the limb bones from of the sexes birds in juv. plumage & those of 2nd or ad. plumage.

```
      4 7 4
  ---------
917 ) 4350
      3668
  ---------
      6820
      6597
  ---------
       223
```

```
      5 0 2
  ---------
915 ) 4600
      4575
  ---------
        25
```

Marten

Parasitic Jaeger

	humerus	tarsus	femur	tibia	ulna	coracoid	sternum	bill
Bi 365 nt.	104.0 X+	45.6	40.5	+X 68.0	110.2	34.2	breadth 37.7	12.6
♂ " left.	103.7	45.6	40.6	67.0	110.5	34.4	length 65.8	38.4
Bi 391 nt	99.5	—	—	65.6	—	34.5 ap.?	37.0	12.1
♀ " left	99.4	42.5	—	—	106.7	34.2 ap.?	63.6	40.0
Bi 814 nt	103.6.	+X 45.7	40.1	—		34.9	+X 40.4	10.4
♀ 3rd Sh. W left	104.0 X+	45.6	—	—	+X 110.8	35.3 X+	66.2	
Bi 378 nt	97.9		40.0			32.6 nt	— X 33.2	
♀ Bi 378 left Kenneth 303	97.9		39.9			32.8 left	63.3	
Bi 374 nt	96.5	41.8	37.5			32.0 nt	34.1	11.7
♀ 2nd " 374 left Shin 1748	96.3	42.0	37.2			32.2 L	63.2	
Bi 385 nt	99.7	43.7	39.4	—	—	34.0	34.4	13.3
♀ ad " left	—	43.2	39.5	—	108.6	34.2	65.0	
9. W. 2846								
Bi 808 nt	103.2	43.5	39.4			33.8	35.7	11.4
♀ ad " left	103.5	43.4	40.0			34.2	64.2	
1815 Shin								
Bi 386 nt	—	44.8	40.9	—	107.7	33.9	36.4	11.3
♀ 2nd " left	102.8	44.7	+X 41.0	—	—	33.8	66.3	
Shin 2847 9.W	X							
Bi 809 nt	94.4 X-	42.6	37.6	—	-X 101.6	31.4 X-	34.0	11.5
♀ 2nd " left	94.7	-X 41.4	-X 37.4	—	—	32.0	62.8	
Shin 1815 9.								
Bi 632 nt	100.3		39.6	—	108.4	33.3	33.9	
♀ 2nd " left	100.4		39.6	—	—	33.4	+X 61.0	
Shin 302 Kenneth								
Bi 315 nt						34.6	36.1	11.6
♀ 2nd		44.1					64.8	
Shin 2823 9.W		44.0						
Bi 54 nt			—			33.9	34.3	
♀ juv. left			39.9			33.6	66.7 X+	
Shin 2333								
max	104.0	45.7	41.0	68.0	110.8	35.3	40.4 66.7	12.6
min	94.4	41.4	37.4	67.0	101.6	31.4	33.2 61.0	10.4
sum.	198.4	87.1	78.4	incomplete	212.4	66.7	73.6 127.7	23.0
av	99.2	43.5	39.2		106.2	33.3	36.8 63.8	11.5

longi primi M1	
16882	44.7
14017	47.4
16881	47.5
18179	47.6
3733	44.1

5)231.3
46.2

2846	54.4	
18159	51.0	
K 302	56.0	
303	53.1	
18158	55.4	
2806	53.0	
17488	50.7	
2837	54.8	♀ juv.
2847	54.4	♂ 2
3744	57.3	♀ juv.
5043	56.6	♀ ad.
3044	51.0	♂ ad.

12)697.7 (53.9

58
117

53.9
46.2
7.7

Jaegers Ratios

	Humerus to Tarsus	Sternum to Tarsus	Bill to Tarsus	
565	228 %	144	27.6	
391	233 %	149	28.5	
819	228 %	145	22.8	
578	213 % a	138 a	27.9	
574	229 %	150		
385	228 %	150	28.1	
808	238 %	147	26.2	
386	234 %	148	25.2	
632	222 % a	135 a		
809	228 %	151	27.8	
413a	197		20.2	
413b	206		20.5	
797	193	118	22.1	
820	194	119	19.0	

parasiticus

longtailed

humerus
234 − 206 = − 28
228 − 193 = − 35
1462 394
231 − 199 = − 32

sternum
151 − 119 = − 32
144 − 118 = − 26

q_{ad} 30.2 δ_{ad} 32.0

q_{ad} 34.6

32.2

q_2 30.0 δ_2 33.1

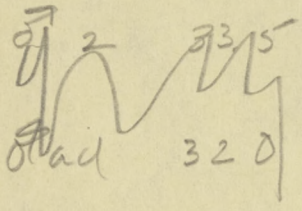
29.5

34.8

q_{pw} 29.9

29.0

27.2



Long-tailed Jaeger

	Humerus	Tarsus	Femur	Tibia	Ulna	Coracoid	Sternum	Beak
Bi 413 ad.	83.8	42.5'						
adult 16884 left	84.0	— 42.8						8.7
Bi 4136 ad.	87.5'	42.3						~~8.8~~
" left	87.6	42.4						~~8.5~~
Ithis 16882, ~~16883~~								
Bi 797 ad.	—	—	—	62.X	—	28.2	Gr. 32.7	9.5'
imm. " left	83.0 X—	42.9	35.0	62.0	91.2	—	length 50.5'	
Ithis 3733 S.W.		42.8						
Bi 820 ad.	86.6	44.6	35.7			29.2	29.0	8.5'
imm. " left	86.7	+ 44.7	35.8			29.5'	53.5'	
Ithis								
max	87.6	44.7	35.8			29.2	32.7 53.5'	9.5'
min	83.0 —	42.3 —	35.0 —			— 28.2 —	29.0 50.5'	8.5'
7	1706	870	708			577	59.8 1040	18.0
						28.8	29.8 52.0	9.0
av.	85.3	43.5	35.4					
	99.2	43.5'	39.2			33.3	36 8 63.8	11.5'
av. para.								
dif. in av.	−13.9	00.0	− 4.8			− 4.5	− 7.0 − 11.8	− 2.5
dif. in max. bet. max. long. min. para	− 6.8	+ 3.3	− 1.6			− 1.9	− 0.8 − 7.5	− 0.9
dif. bet. max. S.	− 16.4	− 1.0	− 3.2			− 5.8	− 8.0 − 13.2	− 3.1
dif. bet. min.	− 13.4	+ 0.9	+ 2.4			− 3.2	− 4.1 − 10.5'	− 1.9

X X

	longicaudus					parasiticus				
	No. of spec. (sides)	ad	aver.	longest	shortest	av.	No. spec.		Dif. in mm bet. longest & shortest sp.	bet. av.
Humerus	4	2	85.5	87.6	— 94.3	100.4	12	8	6.7	14.9
Ulna	2	1	91.3	92.0?	— 101.8	107.2	10	5	8.8	15.9
Radius (3 spec.)	2	0	89.1	89.3	— 98.5	103.5	9	5	9.2	14.4
Femur	2	0	35.4	35.9	— 37.2	39.4	9	5	1.3	4.0
Tibia	1	0	62.0	62.2	— 65.6	67.0	2	2	3.4	5.0
Tarsus	6	4	44.6	46.3	— 43.1	45.3	15	9	3.2	0.7
Coracoid	2	0	30.2	30.7	— 32.7	34.3	11	7	2.0	4.1
Sternum Length	2	0	60.1	61.4	— 70.6	76.7	12	8	9.2	16.6
Pelvis Length	2	0	47.2	48.5	— 52.4	53.9	10	8	3.9	6.7
Breadth	2	0	21.8	22.3	— 23.6	25.3	10	8	1.3	3.5
Carpus	5	3	46.2	47.6	— 50.7	53.9	12	7	3.1	7.7
Beak				9.4	10.0					

Dif. in shape of troch. of femur
" " " " head " coracoid

4/3708
92.6

4/3607
90.6

Humerus S. longi.

83.0	6889.00
83.9	7044.21
83.7	7005.69
86.7	7516.89
86.6	7499.56
87.6	7673.76
87.5	7656.25

7) 599.0

85.57

7) 51285.36

7326.4371

7322.5249

3.9122 = 1.75 ± = standard dev.

87.5 max.
+ 1.75
89.25

87.5
3.28
90.78

10.0
4.5
5.5

94.5 — 8930.25
94.3 — 8892.49
96.2 — 9254.44
96.4 — 9292.96
97.8 — 9564.84
97.8 9564.84
100.3 — 10060.09
99.3 — 9860.49
99.4 — 9880.36
99.6 — 9920.16
100.3 — 10060.09
102.7 — 10547.29
103.2 — 10650.24
103.1 — 10629.61
103.9 — 10795.21
103.6 10732.96
100.2 10040.04
100.0 — 10000.00
103.6 10732.96
103.8 10774.44
104.6 10941.16
104.5 10920.25

22209.1
M = 100.141

22 | 2220451.7 (100.92.96
22
204
194
65
21

$M^2 = 10082.1681$

10092.9600
10082.1681
10.7919

$\sqrt{\frac{\Sigma x^2}{n} - M^2} = 3.28 = \sigma$

min 94.30
— 3.28
91.02

Humerus - S. jara.

104.60
3.28
107.88

= 12 specimens

211
198
137
132

34.9	1218.01	1253.41
35.9	1288.81	1253.16
2)70.8	2506.82	.25 = .5 = 0
35.4	1253.41	

35.9
5
36.4

Femur longi.

37.4	37.4	1398.76
37.4	37.2	1383.84
37.2	39.8	1584.04
37.5	39.4	1552.36
39.7	40.9	1672.81
39.9	39.8	1584.04
39.5	40.0	1600.00
39.4	39.4	1552.36
40.9	40.4	1632.16
39.9	9)354.3	13960.37
39.7	39.36	1551.1522
40.0		
39.4		
40.4		

1551.1522
1549.2096
1.9426 = 1.40

37.2
− 1.4
35.8
overlaps longi.

40.4
1.4
41.8

femur para

46.8	2190.04	2275.713
45.1	2034.01	2269.855
47.3	2227.29	5.858 = 2.43
44.6	2460.16	
46.8	2190.04	
46.1	2125.21	
51.8	2683.24	
7)333.5	15929.99	
47.643	2275.713	

45.10
− 2.43
42.67 doesn't quite overlap

femur pom.

S. faecalis
humeris

118.9
110.8
112.1
109.8
115.3

5) 566.9 (113.38
5
06
5
16
15
19
15
40

14137.21
12276.64
12566.41
12056.04
15294.09

5) 6433039
12864.070
12855.024
11.046 = 3.32

110.80
3.32
107.48

109.8
104.6
5.2

113.3
100.4
12.9

100.41
85.57
14.84

118.9
94.3
24.6

104.6
83.0
21.6

109.8
104.5
5.3

94.3
87.5
6.8